CLAIMS

1. Method for allocating a bandwidth (BW) between a plurality of network terminals (NT_x) coupled, via a common link, to a main network station (LT) in a communication network including a medium access controller (MC) with a guarantee counter (G_x) for each dependent terminal, a determined guarantee increment ($IncG_x$) and a determined guarantee maximum ($MaxG_x$) being defined for each guarantee counter and a guarantee stack (GS) for storing permits to be forwarded to the network terminals, each permit containing a network terminal identifier and corresponding to a predetermined share of bandwidth, said method including for defining permits :

a first step by:

- updating the current value of each guarantee counter (G_x) by adding the corresponding guarantee increment ($IncG_x$) ;
- stacking a permit in the guarantee stack (GS) and diminishing the current value of a guarantee counter (G_x) with the guarantee maximum ($MaxG_x$), if this current value exceeds the guarantee maximum ($MaxG_x$) ;

said method being characterised in that the medium access controller (MC) includes also a fair counter (F_x) for each dependant terminal with a determined fair increment ($IncF_x$) and a fair maximum ($MaxF_x$) defined for each fair counter, and a fair stack (FS) for storing permits to be forwarded to the network terminals, and in that said method also includes the following two steps for defining and forwarding permits :

a second step by :

- updating the current value of each fair counter (F_x) by adding the corresponding increment ($IncF_x$) ;
- stacking a permit in the fair stack (FS) and diminishing the current value of a fair counter (F_x) with the fair maximum ($MaxF_x$), if this current value exceeds the fair maximum ($MaxG_x$) ;

a third step to forward a permit by :

- forwarding an idle permit, if the guarantee stack (GS) and the fair stack (FS) are both empty ;
- extracting a permit from the fair stack (FS) and forwarding it, if the guarantee stack (GS) is empty and the fair stack (FS) is not empty ;

extracting a permit from the guarantee stack (GS) and forwarding it, if the guarantee stack (GS) is not empty.

2. The method according to claim 1, further characterised in that the second step is performed only if the guarantee stack (GS) is empty.

3. The method according to claim 1, further characterised in that the second step is performed only if the guarantee stack (GS) and the fair stack (FS) are empty, and in that the second step is repeated until the fair stack is not empty.

4. The method according to claim 1, 2, or 3, further characterised in that the fair increments ($IncF_x$) and/or the fair maxima ($MaxF_x$) are dynamically updated according to a load measurement of their corresponding network terminal.

5. The method according to claim 4, further characterised in that said load measurement is based on a queue length.

6. The method according to claim 5, further characterised in that said load measurement is relevant when said queue length is over a predetermined threshold value.

7. A communication network including a main network station (LT) coupled to a plurality of network terminals (NT_x), through a common link

(L), and a medium access controller (MC) for bandwidth allocation between network terminals on the common link, said medium access controller including counters and stacks for allocating and forwarding permits to network terminals, each permit containing a terminal identifier and corresponding to a predetermined share of bandwidth, said medium access controller (MC) comprising :

- a guarantee counter (G_x) for each network terminals, with a determined guarantee increment ($IncG_x$) and a determined guarantee maximum ($MaxG_x$) for each guarantee counter, a guarantee stack (GS) for storing permits to be forwarded to the network terminals
- programmed means for defining permits according to the following first step :

said first step including :

- updating the current value of each guarantee counter (G_x) by adding the corresponding guarantee increment ($IncG_x$) ;
- stacking a permit in the guarantee stack (GS) and diminishing the current value of a guarantee counter (G_x) with the guarantee maximum ($MaxG_x$), if this current value exceeds the guarantee maximum ($MaxG_x$) ;

said network being characterised in that the medium access controller also comprises :

- a fair counter (F_x) for each network terminal with a fair increment ($IncF_x$) and a fair maximum ($MaxF_x$) for each fair counter, and a fair stack (FS) for storing permits to be forwarded to the network terminals,
- programmed means for defining and forwarding permits by including also the following two steps :

a second step by :

- updating the current value of each fair counter (F_x) by adding the corresponding increment ($IncF_x$) ;

- stacking a permit in the fair stack (FS) and diminishing the current value of a fair counter (F_x) with the fair maximum ($MaxF_x$), if this current value exceeds the fair maximum ($MaxF_x$) ;

a third step to forward a permit by :

- forwarding an idle permit, if the guarantee stack (GS) and the fair stack (FS) are both empty ;
- extracting a permit from the fair stack (FS) and forwarding it, if the guarantee stack (GS) is empty and the fair stack (FS) is not empty ;
- extracting a permit from the guarantee stack (GS) and forwarding it, if the guarantee stack (GS) is not empty.

8. The communication network according to claim 7, further characterised in that the medium access controller comprises programmed means for performing the second step only if the guarantee stack (GS) is empty.

9. The communication network according to claim 7, further characterised in that the medium access controller comprises programmed means for performing the second step only if the guarantee stack (GS) and the fair stack (FS) are empty, and for repeating the second step until the fair stack is not empty.

10. The communication network according to claim 7, 8, or 9, further characterised in that the medium access controller comprises programmed means for dynamically updating the fair increments ($IncF_x$) and/or the fair maxima ($MaxF_x$) according to a load measurement of their corresponding network terminal.

11. The communication network according to claim 10, further characterised in that the medium access controller comprises programmed means for performing said load measurement based on a queue length.

12. The communication network according to claim 11, further characterised in that the medium access controller comprises programmed means for performing said load measurement by comparing said queue length to a predetermined threshold value.

13. A communication network according to one of the claims 7 to 12, characterised in that it comprises a medium access controller included in a main network station.

14. A medium access controller for a communication network including a main network station (LT) coupled to a plurality of network terminals (NT_x), through a common link (L), and a medium access controller (MC) for bandwidth allocation between network terminals on the common link, said medium access controller including counters and stacks for allocating and forwarding permits to network terminals, each permit containing a terminal identifier and corresponding to a predetermined share of bandwidth, said medium access controller (MC) comprising :

- a guarantee counter (G_x) for each network terminal, with a determined guarantee increment ($IncG_x$) and a determined guarantee maximum ($MaxG_x$) for each guarantee counter, a guarantee stack (GS) for storing permits to be forwarded to the network terminals
- programmed means for defining permits according to the following first step :

said first step including :

- updating the current value of each guarantee counter (G_x) by adding the corresponding guarantee increment ($IncG_x$) ;
- stacking a permit in the guarantee stack (GS) and diminishing the current value of a guarantee counter (G_x) with the guarantee maximum ($MaxG_x$), if this current value exceeds the guarantee maximum ($MaxG_x$) ;

said medium access controller being characterised in that it also comprises :

- a fair counter (F_x) for each network terminal with a fair increment ($IncF_x$) and a fair maximum ($MaxF_x$) for each fair counter, and a fair stack (FS) for storing permits to be forwarded to the network terminals,
- programmed means for defining and forwarding permits by including also the following steps :

a second step by :

- updating the current value of each fair counter (F_x) by adding the corresponding increment ($IncF_x$) ;
- stacking a permit in the fair stack (FS) and diminishing the current value of a fair counter (F_x) with the fair maximum ($MaxF_x$), if this current value exceeds the fair maximum ($MaxF_x$) ;

a third step to forward a permit by :

- forwarding an idle permit, if the guarantee stack (GS) and the fair stack (FS) are both empty ;
- extracting a permit from the fair stack (FS) and forwarding it, if the guarantee stack (GS) is empty and the fair stack (FS) is not empty ;
- extracting a permit from the guarantee stack (GS) and forwarding it, if the guarantee stack (GS) is not empty.

15. The medium access controller according to claim 14, further characterised in that it comprises programmed means for performing the second step only if the guarantee stack (GS) is empty.

16. The medium access controller according to claim 14, further characterised in that it comprises programmed means for performing the second step only if the guarantee stack (GS) and the fair stack (FS) are empty, and for repeating the second step until the fair stack is not empty.

17. The communication network according to claim 14, 15, or 16, further characterised in that the medium access controller comprises programmed means for dynamically updating the fair increments ($IncF_x$) and/or the fair maxima ($MaxF_x$) according to a load measurement of their corresponding network terminal.

18. The method according to claim 17, further characterised in that the medium access controller comprises programmed means for performing said load measurement based on a queue length.

19. The method according to claim 18, further characterised in that the medium access controller comprises programmed means for performing said load measurement by comparing said queue length to a predetermined threshold value.